Supporting Information

Dendritic Anion Hosts: Perchlorate Uptake by G5-NH_2 Poly(propyleneimine) Dendrimer in Water and Model Electrolyte Solutions.

Environmental Science and Technology

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Table S1. Selected Properties of Perchlorate and Related Anions.

Anion	[a]Ionic Radius (nm)	[b]Charge-to-Size Ratio	[a]Hydration Free Energy (kJ/mol)	[c]Shape
ClO_4^-	0.240	-4.17	-205	Tetrahedral
Cl^-	0.172	-5.81	-340	Spherical
NO_3^-	0.196	-5.10	-300	Trigonal Planar
HCO_3^-	0.156	-6.41	-335	Trigonal Planar
SO_4^{2-}	0.230	-8.69	-1295	Tetrahedral

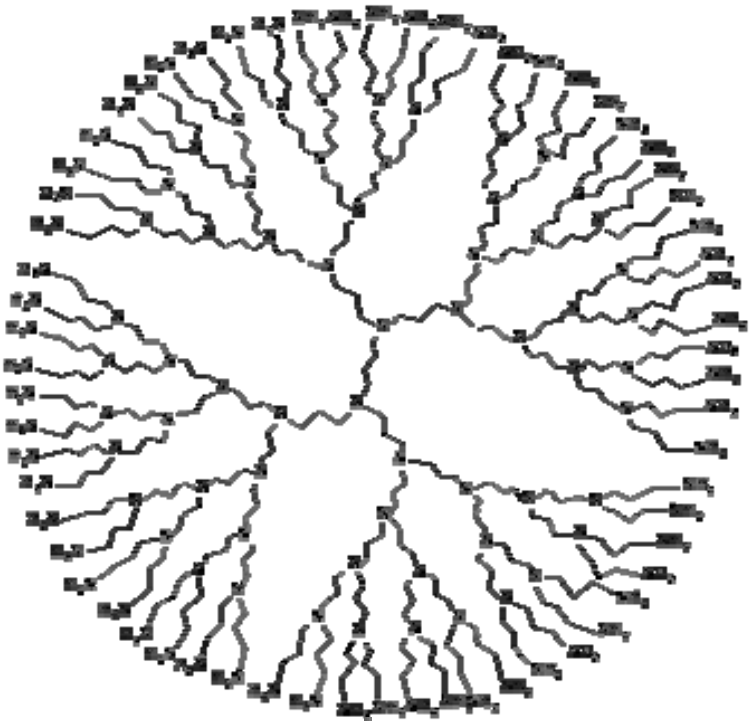
[a]Data compiled by Moyer, B. A. and Bonnese, P. V. Physical factors in anion separations. In *Supramolecular Chemistry of Anions*. Bianchi, A.; Bowman-James, K. and Garcia-Espana, E. Ed.; Wiley-VCH, New York, 1997, pp 1-44.

[b]Equal to the ratio of the charge of the anion to its ionic radius.

[c]Geometrical arrangements of anions taken from Gloe, K.; Stephan, H. and Grotjahn, M. Where is the anion extraction going? *Chem. Eng. Technol.* **2003**, 26,1107-1117.

Figure S1: 2-D Structures of PPI and PAMAM dendrimers.

A. G5-NH_2 PPI Dendrimer



B. G4-NH_2 PAMAM Dendrimer

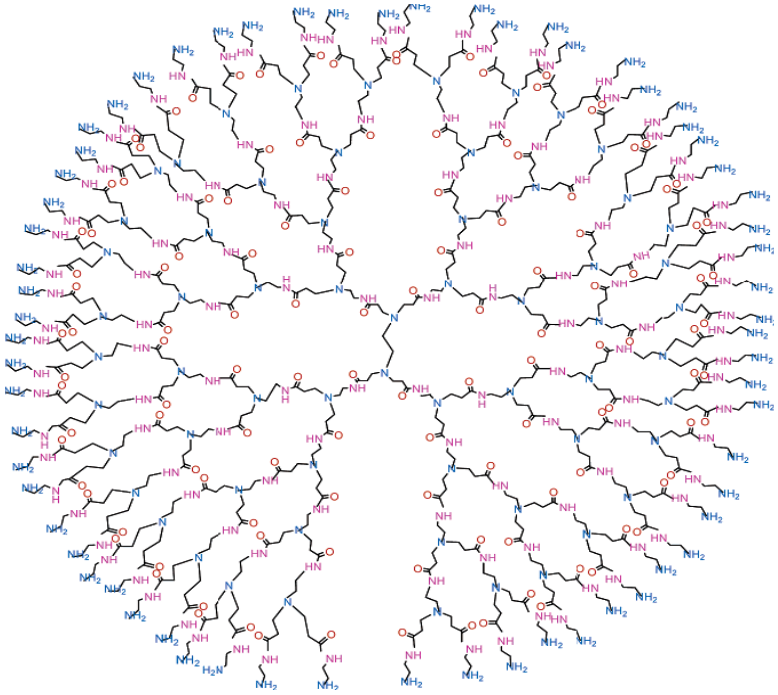


Figure S2: Fractional binding of perchlorate to G5-NH_2 PPI and G4-NH2 PAMAM dendrimers in deionized water. The initial perchloration concentration in solution is 1000 ppb (0.01 mM).

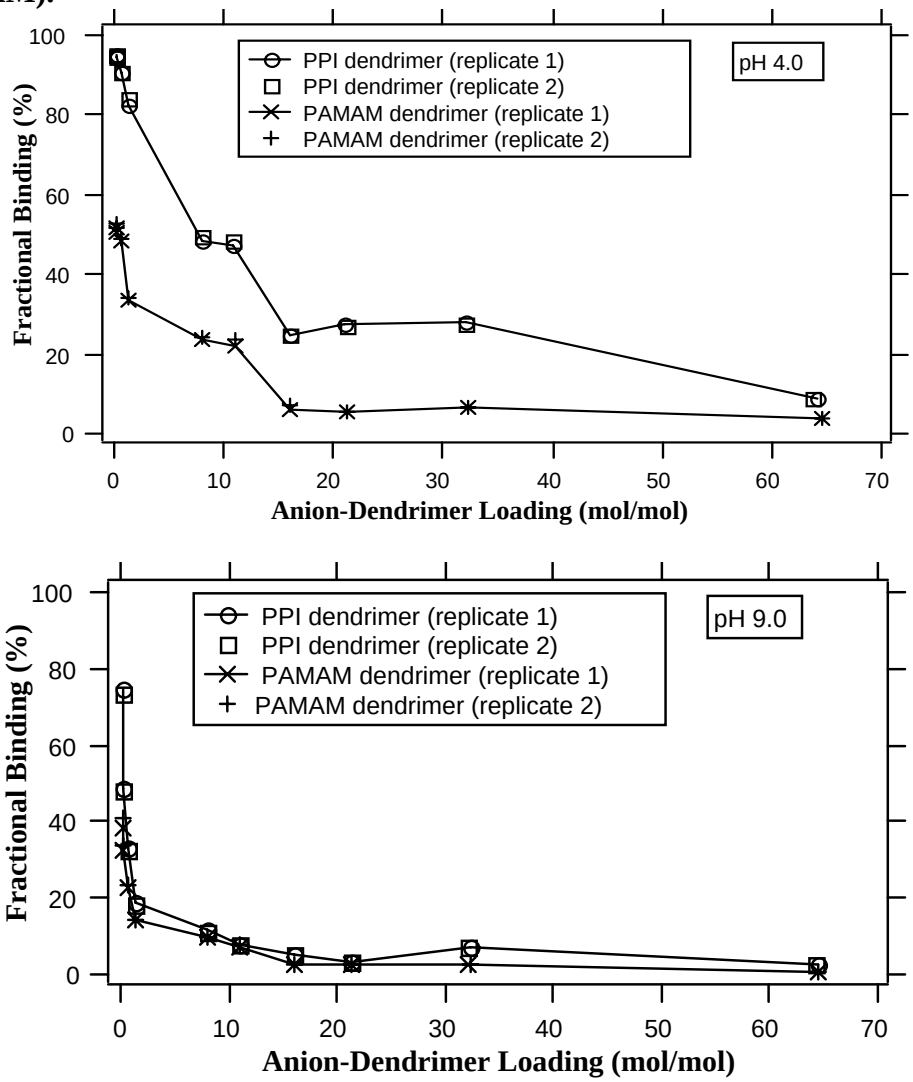


Figure S3: Fractional binding of perchlorate to G5-NH_2 PPI dendrimer in deionized water and model electrolyte solutions at room temperature and reaction time of 1 hr. The initial perchloration concentration in solution is 1000 ppb (0.01 mM). Electrolyte 1 consists of an aqueous solution containing 0.1 mM NaCl, 0.3 mM $NaHCO_3$, 0.1 mM $NaNO_3$ and 0.1 mM Na_2SO_4. Electrolyte 2 consists of an aqueous solution containing 1.0 mM NaCl, 3.0 mM $NaHCO_3$, 1.0 mM $NaNO_3$ and 1.0 mM Na_2SO_4.

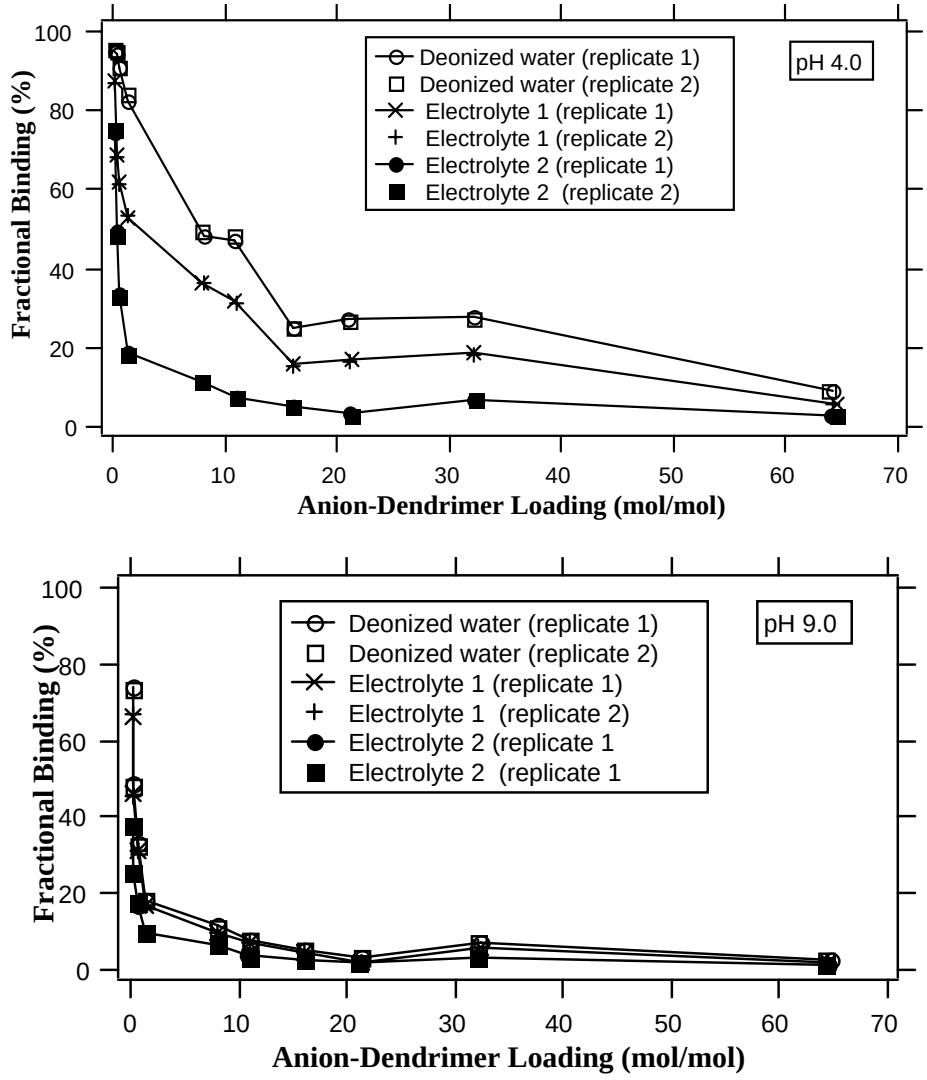


Figure S4: Fractional binding of perchlorate to G5-NH_2 PPI dendrimer in deionized water, electrolyte and mixture of electrolyte + G4-NH_2 PAMAM dendrimer at room temperature and reaction time of 1 hr. The initial perchloration concentration in solution is 1000 ppb (0.01 mM). The electrolyte consists of an aqueous solution containing 1.0 mM NaCl, 3.0 mM $NaHCO_3$, 1.0 mM $NaNO_3$ and 1.0 mM Na_2SO_4.

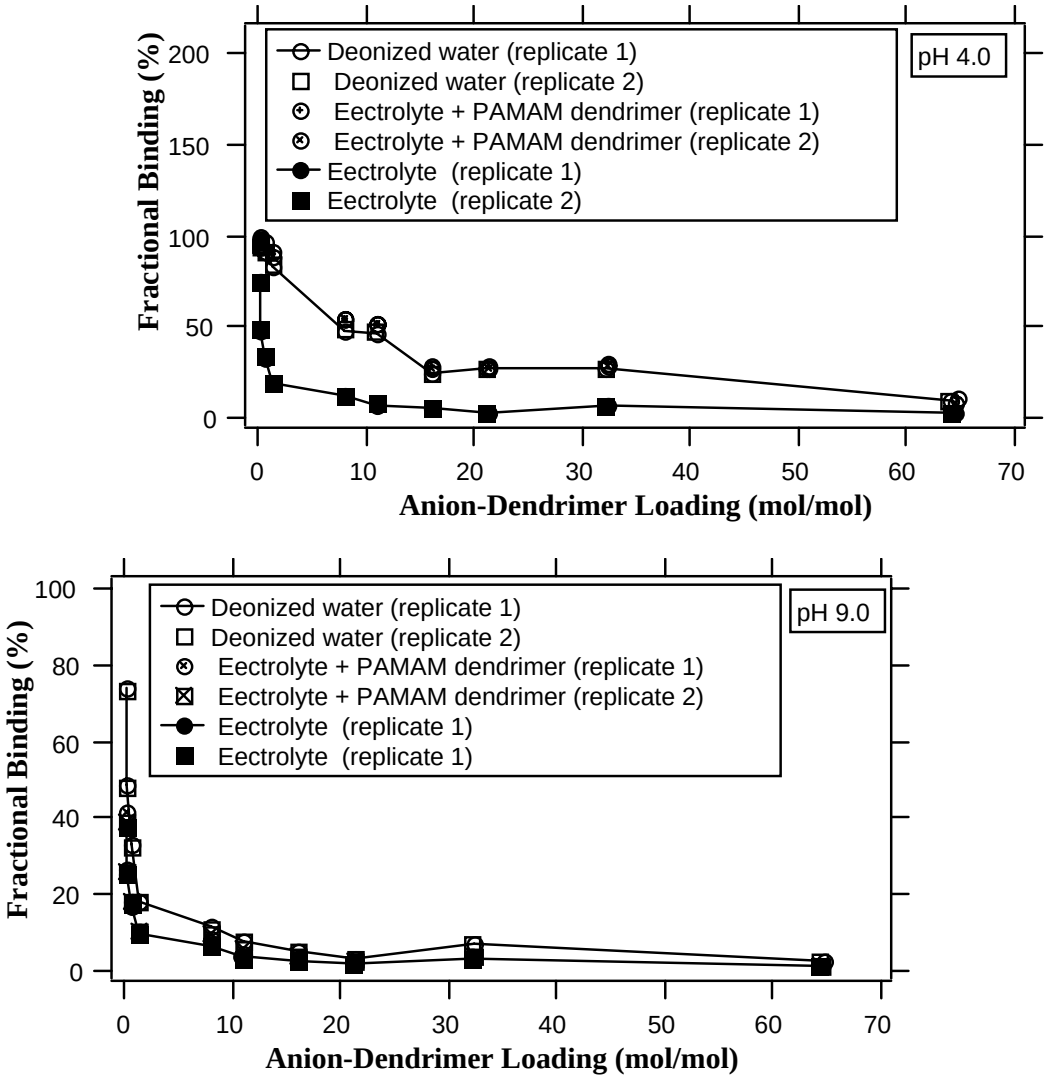


Figure S5: Fractional binding of perchlorate to G5-NH_2 PPI dendrimer in deionized water and electrolyte at room temperature as a function of reaction time. The initial perchloration concentration in solution is 1000 ppb (0.01 mM). The electrolyte consists of an aqueous solution containing 1.0 mM NaCl, 3.0 mM $NaHCO_3$, 1.0 mM $NaNO_3$ and 1.0 mM Na_2SO_4.